

MODULE SPECIFICATION • ELECTIVE

Python Programming Best Practices for Data Science

This course covers best practices in Python programming. It focuses on structuring code, commenting code, using versioning tools like Github, and setting up data science projects in Python which allow for effective collaboration and maintenance of code while working with other coders in large projects.

10	15h	85h	100h
CREDITS	CONTACT HOURS	PRIVATE STUDY	TOTAL STUDY

COURSE CONVENOR

NAME Régis Amichia

OFFICE By appointment — please email to arrange a convenient time

COURSE STRUCTURE

Econ 626 is a 10-credit course and students are expected to input approximately 100 hours of study. The total number of contact hours is 15 hours, leaving 85 hours for private study. Delivery is by lectures — 15 hours across the first three weeks of term, comprising 10 hours of lectures and 5 hours of tutorials. Optional clinics run on the last day of the course.

During private study, balance the course material (the primary source) against the recommended textbooks: think critically about how these fit into the body of knowledge, perform the exercises, complete coursework and revise. You can expect to perform well only by working consistently through the year.

Prerequisite. Must have successfully completed ECON 7920 and ECON 7921.

MODULE PROGRAMME

LECT.	TOPIC	SESSION CONTENT
01	Clean code in Python	— The basics of writing clean code in Python — The Python style guide — Naming variables, functions, classes, methods and sequences — Documenting the code — Block comments, in-line comments and docstrings
02	Loops, layout and object-oriented practice	— How to write clean Python loops with enumerate, zip, break and the else clause — Best practices for indentation, line breaks, blank lines and whitespace in Python — Best practices for object-oriented programming
03	Introduction to GitHub	— What is Github? — Tracking code changes — Collaborative coding — Managing projects with repositories
04	Working with repositories	— Project cloning and working on local copies — Staging and committing — Branching and merging — Pull the latest version of the project to a local copy — Pushing local updates to the main project
05	Tracking changes and history	— Files that are changed, added or deleted — You select the modified files you want to stage — Seeing the full history of every commit — Reverting back to a previous commit

KEY SKILLS

By the end of this course, students should have some knowledge and understanding of:

- **Cloud computing proficiency.** Ability to leverage cloud computing services for data science projects.
- **Collaborative coding with GitHub.** Skills in using collaborative coding environments, particularly GitHub.
- **Machine learning deployment.** Proficiency in deploying, testing and maintaining machine learning models.
- **Tools utilisation.** Effective use of tools such as GitHub for collaborative coding.
- **Practical application.** Application of cloud computing to data science work.

DESIRED OUTCOMES

By the end of this course, students should be able to:

- Write high quality and easy-to-maintain Python scripts
- Adhere to best coding practices
- Be confident in sharing code with others
- Be familiar with using versioning systems such as Github
- Be confident in using Python in data science projects



- Understand how to best structure code for clarity, readability and easy maintenance
- Know how to use Github for collaborative coding projects
- Know how to make use of the Python programming language in the best possible way for data science projects

ASSESSMENT

WEIGHTING	100% coursework
ISSUED	End of week 6
DUE	End of week 10 — four weeks for completion
SUBMISSION	Electronically via the Moodle site for this course
FEEDBACK	Returned within 4 weeks of the deadline, as marker's notes appended to the PDF of your coursework

Marking criteria and penalties are set out in the Economics Undergraduate Handbook and the general course information paper, available via the Current Student page of the university website under Academic Regulations.

COURSE TEXT & RECOMMENDED READING

Book chapters and online material. Copies of the lecture slides are made available on the course web pages, together with additional material and course announcements.

- Python Data Science Handbook: Essential Tools for Working with Data. O'Reilly
- Chollet, F. Deep Learning with Python. Simon and Schuster